EFFICACY REVIEW

PRODUCT:	89670-R, Black Pearl Paste Lodi Group. Grand Fougeray, France
DATE:	August 9, 2017
DP NUMBER:	441854
DECISION NUMBER:	474788
GLP:	No
CHEMICAL:	Alpha-chloralose
EPA PC CODE:	476200
PURPOSE:	Review submitted laboratory palatability/lethality data to determine if they support registration of the new active ingredient alpha-chloralose.
MRID:	50273802
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BACKGROUND:

Since early 2013, Lodi Group of Grand Fougeray, France has pursued registration of the new active ingredient alpha-chloralose. Two products are proposed for registration, including a technical product (89670-E) and an end-use product (89670-R) containing 4.0 or 4.45% alpha-chloralose.[1] As alpha-chloralose is not currently registered in the U.S., Lodi is in the midst of submitting the EPA-required data for a new rodenticide active ingredient for use against house mice (*Mus musculus*) indoors.

The efficacy studies required to support U.S. registration for a new active ingredient rodenticide for use against house mice are listed below.

1. A study that establishes the acute oral LD_{50} of the chemical for house mice.
2. A laboratory study that assesses the palatability and lethality of a bait containing the chemical against wild-type house mice (*Mus musculus*).
3. Five indoor field trials, each conducted in a different region of the U.S.
4. One outdoor field trial (if no claim for controlling house mice via outdoor placements is proposed, this requirement does not apply).

[1] As was noted by Bill Jacobs in a previous efficacy review dated 04/26/16, the proposed CSF and label describe different nominal amounts of active ingredient for some reason.

Lodi's U.S. agents have previously expressed difficulty in getting entities to perform these tests and have proposed to reduce the number of indoor regional field trials from 5 to 3. Thus far, Lodi has fulfilled the acute oral LD_{50} requirement, as well as 1 of the 3 indoor regional field trials. The data reviewed below would address the required laboratory palatability/lethality data for alpha-chloralose (i.e., #2 above).

DATA SUMMARY

Witmer, G. (2016) Cage Efficacy Study of an Experimental Rodenticide using Wild-Caught House Mice. Project Number: 15/7485/1123/RA. Unpublished study prepared by USDA/APHIS Wildlife Services. 22p.

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This report includes a summary of trials conducted using a bait identified as a "paste bait containing 4.3% alphachloralose" against wild-caught house mice from the Fort Collins, CO area. According to the report, 3 such trials were conducted, including a 2-choice test, a no-choice test, and then another 2-choice test run at a lower environmental temperature (62ºF). For the 2-choice tests, the candidate alpha-chloralose bait was tested alongside the standard EPA challenge diet.[2] Of these 3 trials, only the first 2-choice test is required to support the palatability/lethality criterion for alpha-chloralose for EPA registration (i.e., a trial which is run in accordance with EPA Protocol 1.210 and/or 1.220).

For the initial 2-choice test, procedures which appear to have corresponded to EPA Protocol 1.210 were reportedly followed, with an appropriate acclimation period, individual caging, and presentation of the toxic bait alongside the EPA challenge diet on the first day of bait exposure.[3] After a 2-day bait exposure period, the mice were "put into clean cages with the maintenance diet for a 5-day post-exposure [monitoring] period".[4]

Results from the initial 2-choice test were poor, as only a single (1) mouse in the test group perished, with all of the others (19) having survived. None of the control mice reportedly died during the trial. As raw data providing consumption figures and behavioral symptoms were not submitted (among others), it cannot be determined whether any of the surviving 19 individuals rejected the bait from the onset of the bait-exposure period, or whether any individuals sampled the bait, became symptomatic, and then recovered and subsequently rejected the bait (i.e., "bait shyness").[5] What is clear is that this 5% mortality figure falls far short of the protocol-required 90% minimum mortality criterion for these trials. While the report is lacking in raw data, there would seem to be little point in requesting these data given the results of this trial.

Following this trial, the researchers decided to run a no-choice trial to "make sure that there was an adequate concentration of the alphachloralose in the paste bait to cause mortality". Five mice were reportedly used for this trial, with the result of 100% mortality having been reached within "1 to 6 days" of the beginning of the bait exposure period. A 100% mortality figure is the *expected* result with no-choice testing, as the test subjects must either consume the bait or "go hungry". As no control group appears to have been run concurrently with the test group (in addition to other non-guideline methods), this trial was clearly run as a sort of "quick check" of

[2] Though raw data related to the preparation and handling of the EPA challenge diet per Protocol 1.210 were not provided with the report, page 7 indicates that the EPA challenge diet was created "as required by the USEPA".
[3] Some of these methods are summarized rather than supported with actual raw data entries, but for reasons that will become clear later in this review, additional raw data are not required at this time.
[4] Re-caging test subjects prior to the post-exposure monitoring period is a somewhat unusual procedure that could have conceivably unsettled the mice to some degree.
[5] As bait-shy rodents can stymie control efforts, it is important to identify if and when this occurs. Due to the relatively fast toxicological action of alphachloralose, the possibility for bait-shyness to occur cannot be ruled out.

the bait to determine whether it was capable of killing mice *at all*, versus a test of its suitability as a bait for EPA registration.

The final trial conducted by the researchers was essentially a repeat 2-choice test of the alpha-chloralose bait alongside the EPA challenge diet, but at an environmental temperature of 62ºF instead of room temperature. Page 9 of the report states that "all other aspects of the trial were conducted as per the [room temperature] trial."

Results from this trial were also poor in that only 7 mice in the test group perished, with the others (13) having survived, for a mortality figure of 35%. No control mice reportedly died during the trial. This figure, while better than the 5% figure reported in the first 2-choice test, still falls well short of the 90% criterion prescribed in the EPA protocols.

Explanation for these results (and for the previous trials) was provided on page 10 of the report, with the author commenting that

> temperature does appear to make a difference in efficacy of this rodenticide; efficacy increased from 5% at the higher temperature to 35% at the lower temperature….Based on the results of our case efficacy trials at two different temperatures, it would seem that a temperature effects study could prove valuable. On the other hand, because the paste bait is only meant for use inside buildings, it would be most valuable to have a formulation that was effective at room temperature or perhaps at a somewhat lower temperature but not substantially lower….The fact that very little of the paste bait was consumed by the mice suggests that improvement could be made in the formulation to increase the palatability.

CONCLUSIONS

Due to the poor results reported in this trial, these data do not support the palatability/lethality criterion required for registration of alphachloralose as a new rodenticide active ingredient.